



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S) : John Hartwig, et al.
SERIAL NO. : 10/527,899
FILED : March 16, 2006
FOR : Enantioselective Amination and Etherification

Commissioner for Patents
Washington, D.C. 20231

Declaration of Dr. John F. Hartwig

I, John Hartwig, declare as follows:

1. I am a co-inventor of the subject matter of the above-referenced patent application.
2. I am a citizen of the United States of America.
3. In 1986, I received a AB degree in Chemistry from Princeton University, Princeton, New Jersey.
4. In 1990, I received a Ph.D. degree in Chemistry from the University of California at Berkeley.
5. From 1990-1992, I was a postdoctoral fellow at the Massachussetts Institute of Technology, Cambridge, Massachussetts.
5. From 1992 until 2006, I was a Professor (Assistant, Associate and Full) of Chemistry at Yale University, New Haven Connecticut. From 2004-2006, I was the Irénée duPont Professor of Chemistry at Yale University.

Declaration of J. F. Hartwig
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6. I am presently the Kenneth L. Reinhart Jr. Professor of Chemistry at the University of Illinois Urbana-Champaign, in Champaign, Illinois.

7. Since the early 1990's, I have been involved as a researcher at a Ph.D. level in organometallic chemistry, including organometallic catalysis, especially including enantioselective catalysis.

8. I have received more than thirty scientific awards from 1986 through 2009 including *inter alia*, the National Institutes of Health Merit Award, the Edward Mack Jr. Memorial Award (Ohio State University), the Mitsui Chemicals Catalysis Science Award (Japan), the Joseph Chatt Award of the Royal Society of Chemistry, the ACS Award in Organometallic Chemistry.

9. I have given nearly 400 scientific seminars on organometallic chemistry and catalysts.

10. Pursuant to my research, I have supervised dozens of postdoctoral fellows and have had a number of graduate students, both M.S. and Ph.D., study under my guidance.

11. I have published over 200 articles in peer-reviewed publications directed to my research in organometallic and catalytic chemistry.

12. I am an inventor/co-inventor on 9 United States patents directed to organometallic compositions and methods of using those compositions to conduct chemical reactions. I am familiar with the patent application process.

103. I am aware that in the instant application, Examiner McDonough has rejected pending claims 9-12 as being anticipated by Berg Van Den [sic], WO/024466 ("WO

'466"). I understand that that means that the Examiner believes that the invention which is set forth in claims 9-12 is described within the four corners of the WO '466 prior art reference. I respectfully disagree.

14. The Examiner has argued that WO '466 anticipates claims 9-12 of the enclosed amendment response which are directed to five-membered ring metalacycles containing iridium. The Examiner further points to example VI on page 22-23 of WO '466 as an example of how this prior work has involved the combination of a phosphoramidite, base, and metal to form a metalacyclic structure. However, these examples in WO '466, which the Examiner relies on to anticipate the presently claimed invention, were conducted with a ligand lacking a sufficient number of atoms on the amino group to generate a five-membered metalacycle. Thus, example VI involving iridium cannot lead to the structure in the claims of our application 10/527,899. It is a chemical impossibility.

15. Still other examples of WO '466 that include the combination of ligand, base and metal were conducted with ruthenium complexes, not iridium. To my knowledge, no examples of ruthenium metalacycles derived from phosphoramidites have been published or patented. Thus, the combination of phosphoramidite and ligand and related teachings as presented in WO '466 does not teach the structure or conditions to form the iridium metalacycle of claims 9-12 of the present application.

16. Consequently, WO '466 does not describe or anticipate the inventive compositions or method presented in claims 9-12 of the enclosed amendment/response.


117. I understand that the Examiner has also rejected the claims of the instant application as being obvious over claims 1-18 of co-pending patent application s.n. 11/579,221 ("the '221 application") for the reasons which are stated in the office action on page 5. I believe that the present claims are distinguishable over claims 1-18 of the '221 application. In particular,

claims 1-18 of the '221 application are directed to chemical structures that are not described or obvious over structures which are set forth in 9-12 of the present application. The ligands which are described in claims 1-18 of the '221 application are *not* symmetrical. In contrast to the compounds claimed in the '221 application, the presently claimed compositions can lack one of the stereochemical elements which are present in the '221 claimed compositions, and are therefore simpler and less expensive to make, providing catalysts that have similar activity and selectivity as those in the '221 application at substantially reduced cost. In sum, I do not believe that the compositions which are presented in claims 9-12 of the present application are obvious over the compositions which are set forth in claims 1-18 of the '221 application.

18. I further declare that all statements made herein of my own personal knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date:

November 11, 2009



John F. Hartwig, Ph.D.